WHAT IS CLAIMED IS:

1. A vision system hardware component simulation system for machine vision, comprising:

a first model representing at least one object;

a second model representing an optical system; and

a processor that generates an image of a virtual world containing the at least one object based upon the first model and the second model.

2. The vision system hardware component simulation system of claim 1, wherein:

at least one of the first and second models includes information which characterizes the relative orientation and position of the corresponding at least one object and the optical system;

the image of the virtual world comprising an image of the at least one object as seen through the optical system.

3. The vision system hardware component simulation system of claim 1, further comprising at least one additional model representing at least one of a stage, a workpiece fixture and a lighting system, wherein the processor further generates the image of the virtual world based on the at least one additional model.

4. The vision system hardware component simulation system of claim 3, wherein the at least one additional model further represents a stage table.

5. The vision system hardware component simulation system of claim 3, wherein the at least one additional model is a lighting system model that represents at least one of a magnitude, a color, a type and an orientation of at least one lighting source.

6. The vision system hardware component simulation system of claim 3, wherein the first model comprises a representation of at least one of a position and an orientation of the at least one object relative to the stage.

7. The vision system hardware component simulation system of claim 1, wherein the second model comprises:

a lens system model; and

a lighting model.

8. The vision system hardware component simulation system of claim 1, wherein the first model comprises at least one of:

a world model;

a static model;

a stage model; and

a component model.

9. The vision system hardware component simulation system of claim 8, wherein the world model is at least partially constructed from at least one of the static model, the stage model and the component model.

10. The vision system hardware component simulation system of claim 1, wherein the processor comprises:

a rendering engine; and

a lens effects engine.

11. The vision system hardware component simulation system of claim 1, wherein the processor comprises a rendering and lens effect engine.

12. The vision system hardware component simulation system of claim 1, wherein the second model represents an optical system having an infinite depth of field.

13. The vision system hardware component simulation system of claim 1, further comprising a control instruction generation system.

14. The vision system hardware component simulation system of claim 13, wherein the control instruction generation system comprises an inspection program generation system.

15. The vision system hardware component simulation system of claim 13, wherein the control instruction generation system comprises a motion command generation system.

16. The vision system hardware component simulation system of claim 1, wherein the second model characterizes an image capture system and a lens system.

17. The vision system hardware component simulation system of claim 16, wherein the second model characterizes at least one of an aperture, a focal length, an image magnification, and an optical system geometry of the lens system.

18. The vision system hardware component simulation system of claim 16, wherein the second model characterizes at least one of an imaging system pixel size and an imaging system pixel spacing of an image capture system.

19. The vision system hardware component simulation system of claim 1, further comprising a user interface that presents the image.

20. The vision system hardware component simulation system of claim 1, further comprising a user interface includes means for modifying at least one of the first and second models.

21. The vision system hardware component simulation system of claim 1, further comprising a user interface for a machine vision inspection system to simulate, the user interface simulating at least one operation of the machine vision inspection system independent of at least one component of the machine vision inspection system.

22. A method for simulating images based on the characteristics of at least one machine vision hardware component, comprising:

generating a simulated image of a virtual world containing at least one object based upon a first model that characterizes the at least one object and a second model that characterizes an optical system; and

providing the simulated image to a machine vision control system.

23. The method of claim 22, wherein generating the simulated image based on the first and second models comprises:

processing position data characterizing a relative position and orientation of the at least one object and the optical system;

processing component data; and

processing optical system parameters.

24. The method of claim 23, wherein generating the simulated image based on the first and second models further comprises processing lighting system parameters, the lighting system parameters including at least one of a position and an orientation relative to the at least one object, a magnitude, a color and a type of at least one lighting source.

25. The method of claim 22, wherein:

the first model comprises at least one of a component model, a stage

model and a static model; and

generating the simulated image further comprises generating the simulated image based on at least one of the component model, the stage model and the static model.

26. The method of claim 25, wherein the stage model represents at least one of a stage table and a movable stage component.

27. The method of claim 26, wherein the component model includes a representation of at least one of a position and an orientation of the at least one object on the movable stage component.

28. The method of claim 22, wherein the second model characterizes an optical system with an infinite depth of field.

29. The method of claim 22, further comprising generating at least one inspection program instruction based on the simulated image.

30. The method of claim 22, wherein the at least one inspection program instruction is based upon a user input.

31. The method of claim 22, further comprising generating at least one control instruction based on the simulated image.

32. The method of claim 31, wherein generating the at least one control instruction based on the simulated image comprises generating an inspection program.

33. The method of claim 31, wherein generating the at least one control instruction based on the simulated image comprises generating a motion command.

34. The method of claim 22, further comprising:

altering at least one of the first and second models based on at least one user input; and

modifying the simulated image based on the altered one of the first and second models.

35. The method of claim 34, further comprising repeating the altering and modifying steps.

36. The method of claim 35, wherein the repeating continues until the simulated image represents a machine vision system state desired by the user.

37. A method for facilitating the generation of at least one machine control instruction for a machine having a machine vision system independently of at least one element of the machine vision system, the method comprising:

rendering a synthetic image of at least one object as viewed through the machine vision system based on a representation of at least one component of the machine vision system; and

selecting a machine control instruction based at least in part on the synthetic image.

38. The method of claim 37, wherein rendering the synthetic image comprises updating in real-time a view of the at least one object through the simulation of the machine vision system in response to the user altering the representation of the at least one component of the machine vision system.

39. The method of claim 37, wherein rendering the synthetic image is based on a depth of focus represented in the representation of the at least one component of the machine vision system.

40. The method of claim 37, further comprising:

presenting the synthetic image to a user; and

receiving a user input, wherein selecting the machine control instruction is in response to the user input.

41. A method for generating a synthetic image independently of at least one element of a machine vision system, the synthetic image simulating an image from the machine vision system, the method comprising:

initializing a scene of the synthetic image of at least one object as viewed through the machine vision system;

adding a workpiece model of at least one workpiece to the scene, the at least one workpiece positioned on a stage of the scene;

obtaining at least one of a position and an orientation of the stage relative to an optical system of the machine vision system; and

rendering the scene based on at least one of the characteristics of the optical system and the obtained relative position and orientation of the optical system to generate the synthetic image.

42. The method of claim 41, further comprising:

determining if any lens effects are to be applied to the rendered image; and

if any lens effects are to be applied, applying the lens effects to the rendered image.

43. The method of claim 41, further comprising:

determining if an external view is to be rendered based on the rendered scene; and

if the external view is to be rendered, rendering the external view.